system of grammatical analysis, who isn't worth a cent for giving a list of the kings of England, who doesn't know and doesn't care what are the principal productions of Borneo—has a better pair of eyes, a better pair of hands, a better judgment, and even by the standards of the merchant, the manufacturer, and the railroad president, a better head than his master."

The reader has possibly heard such brilliant eloquence at a certain class of popular meetings, where the assertion that the ignorant and book-hating man is the cleverest in the community is always received with cheers. Prof. Woodward himself asks if there "may not be something mischievous in the power of attention to certain book-learning, as shown by the tendency of bookish people to dislike manual labour, and sometimes to become bad citizens?" It is evident enough that "bookish people" do not stand high in his graces. He assures us that his manual education is carried on in the interest of rational intellectual training and culture, but we confess that we fail to see it. These extracts indicate exactly what his standard of "culture" must be. Indeed, he declares that his system, far from being too narrow, is rather too broad.

We cordially believe that Prof. Woodward is an accomplished, skilful, very earnest and successful teacher of wood and metal work to boys over fourteen or fifteen years of age, but we have rarely met with a writer who needed more the caution not to go beyond his last. His work is to all intents and purposes inspired with the belief that all schools should be like his own, and all education for all classes be based on the very limited mechanical training with which he is familiar. That it is admirable to a certain degree, but most inadequate to all the demands of a really good education, is apparent on every page. As he handles all his adversaries without gloves, sparing no one who does not believe his method of education to be perfection, we have the less scruple in setting forth the truth regarding it in plain words. Singular as it may seem, not only to him, but to a great number of reformers, the education of the future will require a much higher stimulant or a far better basis than mere mechanical drawing, hammering, and filing.

OUR BOOK SHELF.

Monographie der baltischen Bernsteinbäume: Vergleichende Untersuchungen über die Vegetationsorgane und Blüthen, sowie über das Harz und die Krankheiten der baltischen Bernsteinbäume. Von H. Conwentz. Pp. 151, mit achtzehn lithographirten Tafeln. (Danzig. London: Williams and Norgate, 1890.)

DR. CONWENTZ was long associated with Goeppert and Menge in the investigation of the "Amber Flora," and indeed wrote the whole, or nearly the whole, of the second volume of the "Flora des Bernsteins," comprising the angiospermous fossils found in Baltic amber. Engaged upon a third volume of this work, devoted to cryptogamous or spore-bearing plants, Dr. Conwentz became impressed with the necessity of first working out the relationships of the trees which yielded the resin now found in a fossil state and known as amber, and those who know the admirably executed plates and exhaustive text of the two volumes issued of "Die Flora des Bernsteins" will not be disappointed with this companion volume.

We cannot attempt a critical review of this work, and must therefore be content with giving the result of Dr Conwentz's investigations, as set forth by himself. During the Tertiary period the division or distribution of land and water, especially in Europe, was very different from what it is at the present time; and in Eocene times, the beginning of this period, the Scandinavian continent extended southward nearly to the Samland district of northern West Prussia and Mecklenburg, and supported a vegetation whose principal types now characterize the flora of the southern parts of the temperate zone and the northern subtropical zone. Evergreen oaks and beeches flourished, associated with palms, laurels, magnolias, and camellias; also the amber trees and various kinds of cypress.

Chief among these amber trees were four species of *Pinus*, not one of which was very closely related to *Pinus sylvestris*, the characteristic fir or pine-tree of the region of the present period. One of the species, with leaves or needles in pairs, recalls some of the North American species belonging to the section *Parrya;* a second resembles the Japanese *Pinus Thunbergii;* and a third, having the leaves in fascicles of five, is near *P. Cembra* and the Japanese *P. parviflora.* In addition there was a kind of spruce more nearly allied to *Picea ajanensis*, of the extreme east of Asia, than to the silver spruce of Germany.

It is probable, Dr. Conwentz believes, that all these different trees and shrubs did not form a mixed forest, but were peculiar to separate regions, and then the amber trees formed dense forests interspersed here and there only with other trees. Dr. Conwentz pictures the conditions under which he imagines these amber trees existed and discharged the resin now so universally employed. The trees he assumes were exposed to the ravages of almost numberless enemies, animal and vegetable, insomuch that there was scarcely a sound tree in the forests. The trees thus enfeebled would be swept down or mutilated by violent storms, causing an abnormal exudation of resin. It seems, however, hardly necessary to insist on the general unhealthiness of the trees to account for the large deposits of resin. Clouded amber is said to be due to the presence of cell-sap in the resin. The majority of the plates illustrate the destruction of the tissues by various fungus parasites. W. B. H.

The Birth and Growth of Worlds. By A. H. Green, M.A., F.R.S. (London: Society for Promoting Christian Knowledge, 1890.)

THIS little work is the extension of a lecture delivered by Prof. Green. It contains an account of various cosmical theories from 1684, when Thomas Burnet, D.D., a learned divine, expounded his "Sacred Theory of the Earth," to recent times. The researches of Prof. Lockyer on the constitution of the heavenly bodies are well described; as are also the hypotheses of Kant and Laplace. A list is given of the chief works bearing on the subject of the lecture. This, in conjunction with the descriptive text, and a few well-chosen illustrations, renders the book extremely useful as a popular short exponent of the many attempts that have been made to fathom the origin of celestial species.

Chambers's Encyclopædia. New Edition. Vol. VI. (London and Edinburgh: W. and R. Chambers, Ltd., 1890.)

THE present volume of the new edition of Chambers's well-known "Encyclopædia" takes in words ranging from "Humber" to "Malta." In every respect it is up to the level of the preceding volumes; and, as usual, scientific subjects have been entrusted to thoroughly competent writers. Under "Hydrophobia" M. Pasteur sketches his discoveries and practices in regard to rabies, while Mr. J. Arthur Thomson contributes "a brief unargumentative review of current adverse criticism." There is an excellent article on insanity by Dr. T. S. Clous-

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ton. Prof. James Geikie writes on igneous rocks and other subjects; Prof. C. G. Knott on hydrodynamics and terrestrial magnetism; Dr. J. Anderson on lake dwellings; Dr. Alfred Daniel on light, lenses, and magnetism; Mr. R. T. Omond on lightning; and Mr. F. E. Beddard on the lion and the leopard. Iceland is described by M. Hjaltalín; India by Sir Richard Temple; the Indian Ocean by Dr. John Murray; the geography of Italy by Mr. W. D. Walker; and Madagascar by the Rev. J. Sibree.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Shaking the Foundations of Science.

MY attention has been drawn to the article in NATURE under the above title, and, as it presents to your readers the proposed South Kensington and Paddington Subway in an aspect which the writer erroneously describes as "the hosts of Mammon threatening the domains of science," I feel sanguine that a scientific journal such as yours will be even more than ordinarily desirous to have the correct view set before them.

The writer appears to ignore the fact that the rectangular area bounded by Kensington, Cromwell, Exhibition, and Prince Albert (now Queen's Gate) Roads forms part of the estate purchased out of the surplus funds of the Great Exhibition of 1851, and vested in a body of Commissioners by Royal Charter; and that this land was originally destined, to use the words of the late Prince Consort, "At no distant day to form the inner court of a vast quadrangle of public buildings, rendered easily accessible by the broad roads which surround them, buildings where science and art may find space for development, with the air and light which are elsewhere well nigh banished from this overgrown Metropolis."

The site of the Exhibition of 1862, and of the buildings of the South Kensington and Science and Art Departments, originally formed part of that estate.

When the Royal Albert Hall was first projected, a pneumatic railway from it to the South Kensington Station *viâ* Exhibition Road formed part of the original scheme, which was promoted by the Commissioners who own the estate, and the paramount necessity of such a means of communication has never been lost sight of.

When the existing subway was constructed in 1885, its continuance as far as the Albert Hall was a recognized part of the project, and the route alongside of the Eastern Arcades was then decided upon by the Commissioners. When the District Railway Company obtained their Act of Parliament for the subway, its use with traction was sanctioned.

The proposal now before Parliament is for absolutely no more and no less, so far as the estate of the Commissioners of 1851 is concerned, than the completion of that subway, with nearly its present form and dimensions, and with almost the same powers to use it in the same way.

All attempts hitherto made to complete the work as far as the Albert Hall have failed, and the existing incomplete portion of the subway is practically closed, and is a dead loss financially.

At last a practical solution of the difficulty has been found, with the additional advantage that, besides the means of covered access being afforded from South Kensington Station through the length of the estate, easy and rapid communication will also be afforded to hundreds of thousands of persons living to the north of Hyde Park to visit and use all the great institutions collected at South Kensington, to which covered access will thus further be secured from all parts of the metropolis.

In his eagerness to prove that the present means of access are all that can be desired, your contributor refers to the congregations of visitors attracted by former Exhibitions. The steady annual decline in the records of the numbers of visitors to the permanent institutions is not the only evidence which entirely refutes such a misleading line of argument.

I do not dispute for one moment that Urania must have her quiet retreats secluded from the movements and throng of men and vehicles, and it is hardly surprising that, as your contributor states, the repose she loves cannot even now be found at South Kensington.

But it is pure affectation to contend that the interests of the highest scientific education for the many will suffer, because laboratories and observatories for original research used for the instruction of a very few experts may have to find a home elsewhere.

If the vibration caused by omnibuses by day and market carts by night, passing in the Kensington and Cromwell Roads at each end of Exhibition Road, to say nothing of "small and earlies," are found already to affect the ultra-sensitive nerves of Urania, the question may be asked why the Professors continue to countenance the expenditure of the "vast sums" mentioned by your contributor, and also, if it is right that any more public money should be allowed to be spent in a way which experience has already shown to be injudicious.

It appears, therefore, evident that the degree to which the traffic in the proposed subway might augment this inconvenience does not affect the true merits of the case as set up by your contributor. C. E. WEBBER.

17 Egerton Gardens.

The Darkness of London Air.

THE interesting article on the above subject which appeared in your issue of December 18 (p. 152) is one of those periodical reminders that Englishmen—as if not content with the innumerable climatic ills to which they are unhappily heirs—are yearly endeavouring their "level best" to make city life more and more polluted and noxious. It is apparently in vain that they are constantly shown how injurious to human comfort in every way, how fatal to plant life, and how destructive to architecture, is this accumulation of unburnt fuel in the air; neither, strange to say, are they more heedful of the enormous annual waste, sheer wâste, of fuel: to all arguments and expostulations they oppose stolid apathy. Seeing how hopeless it is to induce any active interest in this question among the inert mass of citizens, your contributor very sensibly suggests an appeal to the County Council to take up the matter. My object in writing is to offer a further suggestion on the *modus operandi*. Why not invite the Councils of all our learned and scientific Societies and institutions to combine in a memorial to either the County Council or Parliament direct, asking for legislation on this smoke question, and for simple machinery to enforce such legislation? I cannot but think that such a memorial, signed by, *e.g.*, the Royal Society, the Chemical, Linnean, Astronomical, and the various other Societies, by the College of Surgeons, the Royal Academy, and in fact by the representatives of all such corporations would carry very great weight. F. H. P. C.

A Remarkable Flight of Birds.

I HAVE not noticed any reference to the extraordinary flight of birds that was observed in many parts of Devon on the morning of December 21, after the first heavy fall of snow took place at the beginning of the present severe weather. At eight o'clock on Sunday morning I was astonished at a continuous stream of skylarks flying overhead in a westerly direction. The flight continued for more than an hour after that in the most astonishing numbers. Over 500 were counted in three minutes, and the cloud of birds seemed endless in every direction. An old farmer here said that he had seen a similar thing about ten years ago. The birds then were found on the estuaries, and by the sea-coast of Cornwall, where they died by thousands. Several letters have appeared in the local papers announcing a similar migration on the same morning, so that there must have been millions of birds on the wing. One correspondent mentions other birds, thrushes and blackbirds, &c., as well, but here I saw only skylarks. I have seen no record of their destination. It would be interesting to know if any of your readers could tell us where the birds went. They were all flying towards Cornwall. I observed also large detached flocks of plover, flying towards Dartmoor, on the edge of which I live, in a southerly direction. The appearance of these birds all hasting away in perfect silence was almost weird in the dead stillness, all the ground and every twig and bush being covered with deep snow, and not a breath of wind stirring.

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